

USSN 10/024 518

IN THE CLAIMS

Amend the claims as follows:

1. (Currently amended) A ceramic thermal barrier coating wherein at least a portion of the thermal barrier coating comprises columnar grains and comprises a stabilized zirconia coating that includes yttria and hafnia, wherein the hafnia is present in an amount of at least about 15 weight % of at least the portion effective to reduce thermal conductivity of at least the portion of the stabilized zirconia coating.

2. (Cancelled)

3. (Previously presented) The thermal barrier coating of claim 1 wherein at least the portion thereof comprising said stabilized zirconia coating comprises about 15.8 to about 63.4 weight % hafnia, about 2.0 to about 36.6 weight % yttria, and balance zirconia.

4. (Previously presented) The thermal barrier coating of claim 3 wherein at least the portion thereof comprising said stabilized zirconia coating, comprises about 34.3 to about 61.6 weight % hafnia, about 5.3 to about 11.8 weight % yttria, and balance zirconia.

5. (Previously presented) The thermal barrier coating of claim 4 wherein at least the portion thereof comprising said stabilized zirconia coating comprises about 58.1 to about 59.7 weight % hafnia, about 5.3 to about 8 weight % yttria, and about 34 to about 35 weight % zirconia.

USSN 10/024 518

6. (Previously presented) The thermal barrier coating of claim 5 wherein at least the portion thereof comprising said stabilized zirconia coating exhibits thermal conductivity of less than 1.5 W/m-K.

7. (Currently amended) An article comprising a metallic substrate and a ceramic coating on a surface of said substrate, said ceramic coating having at least a portion comprising columnar grains and comprising a stabilized zirconia coating that includes yttria and hafnia, wherein the hafnia is present in an amount of at least about 15 weight % of at least the portion effective to reduce thermal conductivity of at least the portion of the stabilized zirconia coating.

8. (Previously presented) The article of claim 7 wherein hafnia is present in at least the portion of the ceramic coating comprising the stabilized zirconia coating in amount of at least about 15 weight % to about 64 weight % of the coating.

9. (Previously presented) The article of claim 8 wherein at least the portion of the ceramic coating comprising the stabilized zirconia coating comprises about 15.8 to about 63.4 weight % hafnia, about 2.0 to about 36.6 weight % yttria, and balance zirconia.

10. (Previously presented) The article of claim 9 wherein at least the portion of the ceramic coating comprising the stabilized zirconia coating comprises about 34.3 to about 61.6 weight % hafnia, about 5.3 to about 11.8 weight % yttria, and balance zirconia.

USSN 10/024 518

11. (Previously presented) The article of claim 10 wherein at least the portion of the ceramic coating comprising the stabilized zirconia coating comprises about 58.1 to about 59.7 weight % hafnia, about 5.3 to about 8 weight % yttria, and about 34 to about 35 weight % zirconia.

12. (Previously presented) The article of claim 11 wherein at least the portion of the ceramic coating comprising the stabilized zirconia coating exhibits a thermal conductivity of less than 1.5 W/m-K.

13. (Original) The article of claim 7 wherein said substrate comprises a superalloy gas turbine engine blade or vane.

14. (Previously presented) The article of claim 7 further including a bondcoat between said ceramic coating and said substrate.

15. (Currently amended) A method of protecting a surface of a metallic substrate, comprising:

depositing a coating comprising columnar grains and comprising zirconia, yttria and hafnia on the surface, wherein the hafnia is present in the coating in an amount of at least about 15 weight % of the coating effective to reduce thermal conductivity of the coating deposited on the substrate as compared to thermal conductivity of a similar coating having an impurity amount of hafnia.

16. (Original) The method of claim 15 wherein hafnia is present in the coating in amount of at least about 15 weight % to about 64 weight % of the coating.

17. (Original) The method of claim 16 wherein the coating comprises about 15.8 to about 63.4 weight % hafnia, about 2.0 to about 36.6 weight % yttria, and balance zirconia.

USSN 10/024 518

18.(Original) The method of claim 17 wherein the coating comprises about 34.3 to about 61.6 weight % hafnia, about 5.3 to about 11.8 weight % yttria, and balance zirconia.

19.(Previously presented) The method of claim 18 wherein the coating comprises about 58.1 to about 59.7 weight % hafnia, about 5.3 to about 8 weight % yttria, and about 34 to about 35 weight % zirconia.

20.(Currently amended) A coated article comprising a substrate selected from the group consisting of a nickel based superalloy and cobalt based superalloy and a ceramic thermal barrier coating on the substrate, the thermal barrier coating comprising columnar grains and comprising zirconia, yttria, and hafnia, wherein hafnia is present in an amount of at least about 15 weight % of the thermal barrier coating effective to reduce thermal conductivity of the thermal barrier coating as compared to thermal conductivity of a similar thermal barrier coating having an impurity amount of hafnia therein.

21.(Previously presented) The coated article of claim 20 wherein the thermal barrier coating comprises about 15.8 to about 63.4 weight % hafnia, about 2.0 to about 36.6 weight % yttria, and balance zirconia.

22.(Previously presented) The coated article of claim 21 wherein the thermal barrier coating comprises about 34.3 to about 61.6 weight % hafnia, about 5.3 to about 11.8 weight % yttria, and balance zirconia.

23.(Previously presented) The coated article of claim 22 wherein the thermal barrier coating comprises about 58.1 to about 59.7 weight % hafnia, about 5.3 to about 8 weight % yttria, and about 34 to about 35 weight % zirconia.

24. (Currently amended) A ceramic coating comprising columnar grains and comprising zirconia, yttria, and hafnia, wherein hafnia is present in an amount of at least about 15 weight % of the coating effective to reduce thermal conductivity of the ceramic coating as compared to thermal conductivity of a similar ceramic coating having an impurity amount of hafnia therein.

25. (Previously presented) The ceramic coating of claim 24 comprising about 15.8 to about 63.4 weight % hafnia, about 2.0 to about 36.6 weight % yttria, and balance zirconia.

26. (Previously presented) The ceramic coating of claim 25 comprising about 34.3 to about 61.6 weight % hafnia, about 5.3 to about 11.8 weight % yttria, and balance zirconia.

27. (Previously presented) The ceramic coating of claim 26 comprising about 58.1 to about 59.7 weight % hafnia, about 5.3 to about 8 weight % yttria, and about 34 to about 35 weight % zirconia.